Reconstructing ice-proximal surface ocean changes during the Late Holocene from the Antarctic Peninsula

Did anthropogenic climate change already change ocean conditions close to the Antarctic peninsula ice sheet?

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Project description

Anthropogenic climate change has already led to an increase of global average temperature of over 1 degrees and even more so in polar regions. The Antarctic Peninsula stands out as particularly vulnerable to climate change, with vast landscapes covered with glaciers that terminate in a relatively warm ocean. This ocean is warm at the surface and subsurface on the outer parts of the continental shelf, and if this warm water migrates further onto the continental shelf, closer to the ice sheet, it could induce intense ice sheet melt. Historic and observational datasets (both qualitative and quantitative) of climate conditions in this area do suggest retreat of glaciers and greening of ice-free land, however observational data of ocean change are limited. A recent expedition with the Spanish Polar Programme, in February and March 2026, with onboard the two proponents of this BMA, brought back CTD data and core material from a transect from the continental slope of the Antarctic Peninsula, through the Gerlache Strait, all the way to the proximity of the Marine-terminating ice sheets. While the CTD profiles reveal the modern ocean structure at each site of core collection, the box- and gravity core material provides a unique opportunity to reconstruct ocean conditions in this region of the Antarctic Peninsula since the last deglaciation, ~12kyrs ago. In this BMA, the student will have the exciting opportunity to process the first samples and analyse the marine palynological content of the new core material obtained. The proponents of this BMA are experts in dinoflagellate cyst analyses in this region, and the material promised to be spectacular. By the time of the start of this Bright Minds project, the box cores will be dated using ^{210}Pb. The student will process in the HF laboratory the first sets of samples from the box cores, and then analyse its content for dinoflagellate cysts under the light microscope. The student will be trained for said analyses. Together with the BMA student we will analyse the results and paint a first picture of late Holocene ocean changes along the Gerlache Strain of the Antarctic Peninsula. By June we will have the sample material in our possession.

Job requirements

Ideally, the BMA is from the Marine sciences, Earth Life and Climate or Earth Surface and Water programmes and has a soft spot for polar research. Affection with lab work and microscope analyses is a must. Prior experience in these is preferred, but not exactly required, so as long as the student has affection with lab analyses. Students that followed the courses Reconstructing Extreme Climate TRsansitions using microfossils or Reconstructing Quaternary environmental change are particularly encouraged to apply.